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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,457	12/11/2001	Paul G. Davis	9797-0085-999	1703

38426 7590 07/15/2004

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PALO ALTO, CA 94304

EXAMINER

BATAILLE, PIERRE MICHE

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 07/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/014,457	Applicant(s) DAVIS ET AL.	
	Examiner Pierre-Michel Bataille	Art Unit 2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) 1-37 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39-45 47-52 is/are allowed.
- 6) ☒ Claim(s) 38,46,53 and 54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is taken in response to Applicant amendment filed on April 22, 2004. Claims 1-37 have been cancelled and claims 38-54 are pending in the application under prosecution.

Response to Arguments

2. Applicant's arguments filed April 22, 2004 with respect to claims 38 and 46 have been fully considered but they are not deemed to be persuasive for at least the following.

Claims 38 and 46 have been amended to features 'the read command "delayed according to operation code other than a read or write to the slave memory device" prior to completing the processing of at least one of a plurality of write commands'. The added feature, which appears to be the essence of Applicant's remarks, adds no novelty to the previous rejected claimed features.

US 5,778,419 (Hansen et al) teaches a memory system comprising memory core having a plurality of control inputs and a data path for reading and writing operations and executing memory access commands and generating memory access responses with a requester arbiter allowing priority to read requests over write requests (*Col 12, Lines 40-44; Col. 7, Line 61 to Col. 8, Line 4*). US 5,740,398 (Quattromani et al) provides the deficient feature of 'processing read command prior to completing the processing of at least one of a plurality of write commands'. Quattromani further covers

the features added to the claims by teaching that 'writes from the central processing unit core to cache or memory be made in program order wherein the order of the instructions, provided by the programmer, ensures proper program operation' [Col. 2, Lines 36-41]. Therefore, as requested in amended claims 38 and 46, the processing of read and write operations features agreement with operation codes or instructions codes in Quattromani's disclosure.

For the above remarks, claims 38 and 46 are maintained rejected over Hansen in view of Quattromani, and the rejection is updated below. Claims 39-45 and 47-54 are allowed since claims 39 and 47 have been rewritten in independent form including the limitation of their respective base claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 38 and 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hansen et al. (US 5,778,419) and over Quattromani et al. (US 5,740,398).

With respect to claims 38, 46 and 53-54, Hansen teaches a memory system comprising: a communication channel coupled to a master memory device and a slave memory device [140, Fig. 1, 620, Fig. 6, 820, Fig. 8; Col. 2, Lines 38-42; *memory core having a plurality of control inputs and a datapath for reading and writing operations and*

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executing memory access commands and generating memory access responses Col. 3, Lines 44-55]; the master memory device configured to generate control information and associated data information including a plurality of write commands with associated write information [*memory core executing memory access commands and generating memory access responses Col. 3, Lines 44-55*] for each write command to slave memory device followed by any operation code other than a read or write command to the slave memory device followed by a read command [*the master device comprising memory element for temporary storage of memory access commands and response information and forwarding data wherein, for each write command, controlling flow of data output stream comprising memory access responses, forwarding data and clock signals Col. 3, Lines 34-42, Lines 48-64*]; the slave memory device configured to process the read command and complete the processing of at least one of plurality of write commands [*slave device executing memory access commands and generating memory access responses Col. 3, Lines 25-34, Col. 3, Lines 23-32; Col. 6, Line 66 to Col. 7, Line 45*].

Hansen teaches a requester arbiter allowing priority to read requests over write requests [*Col 12, Lines 40-44; Col. 7, Line 61 to Col. 8, Line 4*], but fails to specifically detail the order or operation, i.e. processing said memory read command prior to said memory write command or said slave memory device performing said memory read command prior to performing said memory write command.

However, Quattromani teaches microprocessor chip comprising a memory core processing memory read command prior to memory write command, the system

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includes a write buffer which buffers the writing of data from the CPU core to the data buffer prior to retiring of the data to the cache memory core [Col. 2, Lines 46-50; Col. 8, Lines 46-58], such that writes from central processing unit core to cache or memory be made in program order where the order of the instructions, provided by the programmer, ensures proper program operation [Col. 2, Lines 36-41]; the data buffered in said data buffer include a plurality of cross dependency control bits wherein read accesses are handled relative to write accesses and wherein read accesses are source data to the processor core prior to retiring the data to the cache memory core [Col. 12, Lines 55 to Col. 13, Line 10].

Therefore, it would have been obvious to one having ordinary skill in the art and having the teachings of Hansen and Quattromani before him at the time of the invention to process memory read command prior to memory write command, as taught by Quattromani, in combination the memory system taught by Hansen, because, as taught by Quattromani, memory read operation would not be impacted by write operation performed by the core and it would avoid the possibility that incorrect data may be source to the CPU from a later allocated but not yet executed write operations [Col. 13, Lines 10-15; Col. 3, Lines 2-5]. Quattromani further teaches that the processing of read and write operations features agreement with operation codes or instructions codes such that writes from the central processing unit core to cache or memory are made in program order of instructions, provided by the programmer, to ensure proper program operation [Col. 2, Lines 36-41].

Allowable Subject Matter

5. Claims 39-45 and 47-54 are allowed.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,279,077 (Nasserbakht) teaching bus interface buffer control in a microprocessor.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre-Michel Bataille whose telephone number is (703) 305-0134. The examiner can normally be reached on Tue-Fri (7:30A to 6:00P).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew M. Kim can be reached on (703) 305-3821. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Pierre-Michel Bataille
Primary Examiner
Art Unit 2186

July 10, 2004

**PIERRE BATAILLE
PRIMARY EXAMINER**